# HAZARDOUS COMPONENT SAFETY DATA STATEMENT (HCSDS)

| 1. DATE PREPARED (YYMMDD) | REPORT CONTROL SYMBOL MIL (AR) 1687 |
|---|---|
| 91 May 01 | |

| 2 MATERIAL/COMPONENT/ASSEMBLY | 3. NUMBER | 4. REVISION |
|---|---|---|
| Propellant, IMR-5010 | 10040 | B |

5 APPLICABLE FEDERAL ACQUISITION REGULATION (FAR) SAFETY CLAUSE
28.7102

**PART I - SENSITIVITY (Apparatus and Comparison Values)**

| 6. FRICTION TEST | 7. IMPACT TEST | 8. ELECTROSTATIC DISCHARGE TEST |
|---|---|---|
| See Attached Sheet | Bureau of Mines, 13cm | See Attached Sheet |

**PART II - HAZARDS**

| 9. FIRE | 10. AUTO IGNITION TEMP | 11. FLASH POINT | 12. DECOMPOSITION PRODUCTS |
|---|---|---|---|
| High | 160°C (320°F) | NA | Toxic, Avoid Inhalation and Ingestion |

| 13. FLAMMABLE AND/OR EXPLOSIVE LIMITS | | 14. EXPLOSION | 15. EXPLOSIVE TEMP (5 Sec.) | 16. DUSTS |
|---|---|---|---|---|
| a. LOWER PERCENT | b. UPPER PERCENT | | | |
| NA | NA | Low | Unknown | Unknown |

| 17. HEALTH HAZARD INFORMATION (Toxicity) | 18. UNPACKED (In-Process) HAZARD CLASS (Specify Quantities Involved) |
|---|---|
| Moderate by inhalation and ingestion | ** |

19. SPECIAL REQUIREMENTS (If additional space is needed, use plain bond paper)

Ref-Dwg: 10534796 and Spec: MIL-P-3984
Approved Packaging Deawings: 8858577, 7549033, 8858848, 76-4-46, 76-4-56, 9256486, (76-4-46A, 76-4-48, 76-4-57, 76-4-61)

** (See Attached Sheet)

**PART III - SHIPPING/STORAGE CLASSIFICATION OF ITEM WHEN PACKED IN ACCORDANCE WITH APPROVED PACKING DRAWINGS**

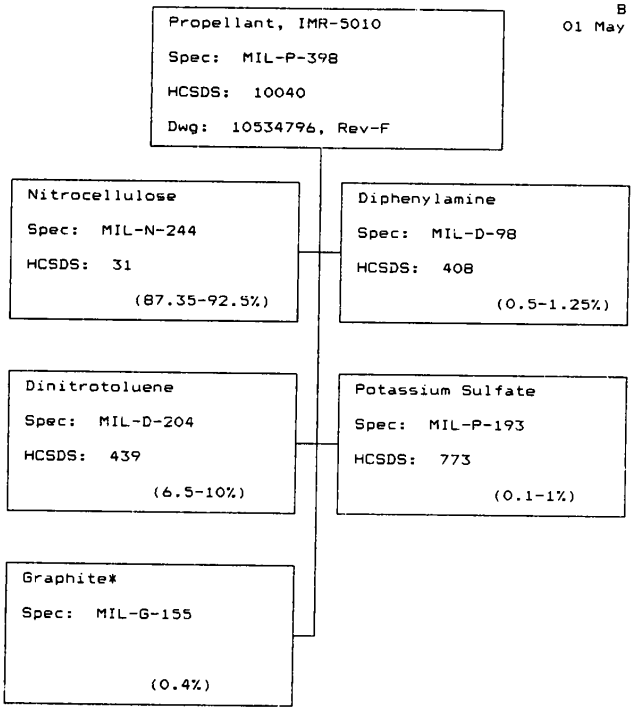
| 20. DOD HAZARD CLASS/DIV | 21. DOD STORAGE COMPATIBILITY GROUP | 22. DOT HAZARD CLASSIFICATION | 23. DOT CONTAINER MARKING |
|---|---|---|---|
| ** | ** | ** | ** |

| 24. PREPARED BY (Initiator) | | |
|---|---|---|
| a. TYPED OR PRINTED NAME | b. SIGNATURE | c. ORGANIZATION |
| R.W. BATSON | R.W. Batson | SAFETY OFFICE, ARDEC |
| **25. CONCURRED IN BY** | | |
| a. TYPED OR PRINTED NAME | b. SIGNATURE | c. ORGANIZATION |
| R.W. SNOOK | R.W. Snook | SAFETY OFFICE, ARDEC |
| **26. SAFETY CHIEF OR AUTHORIZED REPRESENTATIVE** | | |
| a. TYPED OR PRINTED NAME | b. SIGNATURE | c. ORGANIZATION |
| C.R. PETERS, P.E. | C.R. Peters | SAFETY OFFICE, ARDEC |

The information relating to safety (herein referred to as "safety data") contained in this document is limited to those instances when the document is provided as a part of a procurement/production package which involves the development, testing, storage, manufacture, modification, renovation, demilitarization, packaging, transportation, handling, disposal, inspection, repair or any other use of the item, (material/component/assembly) which is specified in the contract. The safety data contained herein are examples which shall be used by the contractor to alert contractor personnel as well as other personnel of hazards associated with the procurement/production of the item. No representation is made that compliance with the information provided will prevent any accident to persons or property or that additional warnings may not be appropriate. Neither the foregoing nor any act or failure to act by the Government in regard to alerting personnel to the hazards of the item shall affect or relieve the contractor of responsibility for the safety of contractor personnel or property and for the safety of the general public in connection with the performance of the contract, or impose or add to any liability of the Government for such safety.



DD FORM 2357, APR 85




* Information on hazards associated with commercial chemicals can be obtained from the supplier. Such information may already be available in the DOD Hazardous Material Information System (HMIS) DOD 6050.5.L which is available from the U.S. Government Printing Office, Superintendent of Documents, Washington, DC.

Special Requirements: (Con't)

1. Propellant IMR 5010 is sensitive to impact, friction, heat or flame and electrostatic discharge. It should be protected from accidental exposure to these stimuli. Data presented is for propellant IMR-4895 which chemically and physically resembles propellant IMR-5010.

2. CAUTION: EXPLOSIVES MUST BE TESTED FOR COMPATIBILITY WITH ANY MATERIAL NOT SPECIFIED IN THE PRODUCTION-PROCUREMENT PACKAGE WITH WHICH THEY MAY COME IN CONTACT. MATERIALS INCLUDE OTHER EXPLOSIVES, SOLVENTS, ADHESIVES, METALS, PLASTICS, CLEANING COMPOUNDS, FLOOR AND TABLE COVERINGS, PACKING MATERIALS AND OTHER SIMILAR MATERIALS, SITUATIONS AND EQUIPMENT. EXPLOSIVES INCLUDE PROPELLANTS AND PYROTECHNICS.

3. Hazard Classification Tests (TB700-2)
Department of Defense Explosive Hazard Classification Procedures, Sep 82

a. Detonation Test - Exploded

b. Ignition and Unconfined Burning Test - No explosion, samples burned. Burning Time 11-15 seconds.

c. Thermal Stability Test - No explosion, burning or change in configuration.

d. Impact Sensitivity Test -

| | No of Trials Exhibiting | | |
|---|---|---|---|
| Height, In | Explosion, Flame or Noise | Decomposition, Smoke, No Noise | No Reaction Smoke or Noise |
| 3 3/4 | 4 | 2 | 4 |
| 10 | 9 | 9 | 1 |

(Ref - Association of American Railroads File No. 15-145, Lab No. 72806, dated 11/20/85)

4. Limited single package tests as described in TB 700-2 were conducted on IMR-4895 propellant (SP, web size 0.014 inches, Lot 43-A) packaged in M24 metal lined container (Dwg: 76-4-46). Five single package tests were conducted. Results produced were classified as "Low Order Explosion." The following classifications for propellant IMR-5010 are interim for shipment and storage of small or in-process quantities when propellant is packaged in accordance with packaging drawing 76-4-46 (M24 container) or in accordance with applicable parts of 49CFR for proper description, packaging, marking and classification the following Interim Hazard Classification is assigned to the subject item:

DOD Hazard Class/Div/SCG: 1.3C
DOD Hazard Class: 1.3C
(Part 173, Subpart C, Part 173.52)
DOT Label: Explosive 1.3C
(Part 172, Subpart B (172.411 (a) & (b))
DOT Proper Shipping Name (PSN): Powder, Smokeless
(Part 172, Subpart B and Part 172.101)
UN Serial Number/PSN: 0161 (Powder, Smokeless)
DOT Container Marking: Powder, Smokeless
UN: 0161
NSN: (as applicable)
DOT Authorization: Part Number (as applicable)
(Part 172, Subpart B, Part 172.301(a) and 172.320(b))
Packaging Method: E-22(a),(b),(c)
Explosive Weight for QD Determination: lbs(kgs): 100% Maximum Container Quantity

(Ref-Yuma Test Rpt 2369, To Determine Experimentally the proper Safety Classification for Propellants Stored in Standard Propellant Containers, Test conducted 2/25/55 thru 8/19/55)

5. Propellant IMR-4895 (web size 0.013 inches - 0.057 inches long x 0.034 inches diameter) was tested by Association of American Railroad, File No. 15-145, Lab No. 72806, dated 11/20/85 (results shown in Para 3 above) and classified by DOT as a Class A Explosive with a DOT Ex-Number of 8511069A, letter dated 12/12/85. In accordance with applicable parts of 49CFR for proper description, packaging, marking and classification the following Hazard Classification is assigned to the subject item:

DOD Hazard Class/Div/SCG: 1.1C
DOD Hazard Class: 1.1C
(Part 173, Subpart C, Part 173.52)
DOT Label: Explosive 1.1C
(Part 172, Subpart B (172.411 (a) & (b))

DOT Proper Shipping Name (PSN): Powder, Smokeless
(Part 172, Subpart B and Part 172.101)
UN Serial Number/PSN: 0161 (Powder, Smokeless)
DOT Container Marking: Powder, Smokeless
UN: 0161
NSN: (as applicable)
DOT Authorization: Part Number (as applicable)
(Part 172, Subpart B, Part 172.301(a) and 172.320(b))
Packaging Method: E-22(a),(b),(c)
Explosive Weight for QD Determination: lbs(kgs): 100% Maximum Container Quantity

6. Additional Sensitivity Data

Radford Test Values

a. Impact: Material exposed to impact energy of a falling weight. Results measured and expressed as joules per square meter of contact. (Ref - Radford Rpt 100.10, dated Sep 76)

Threshold Initiation Level (TIL)

| Material | Condition | Energy, $N/m^2$ |
|---|---|---|
| IMR-5010 | Granules | $1.4 \times 10^4$ |
| Lead Azide | Dry, Solid | $2.2 \times 10^4$ |
| TNT | Dry, Solid | $6.7 \times 10^4$ |
| RDX | Dry, Solid | $2.7 \times 10^4$ |
| Black Powder | Granules | $5.4 \times 10^4$ |
| M1 Propellant | Flake | $1.4 \times 10^4$ |
| M9 Propellant | Flake | $1.7 \times 10^4$ |
| M30 Propellant | Fines | $2.2 \times 10^4$ |

b. Friction: Material exposed to friction generated between stationary wheel and sliding surface (anvil). Results are expressed as newtons per square meter of contact surface at anvil speed used for test (Ref- Radford Rpt 100.10, dated Sep 76)

Threshold Initiation Level (TIL)

| Material | Condition | Energy, N/m2 |
|---|---|---|
| IMR-5010 | Granules | $2.99 \times 10^8/2.4$ |
| Lead Azide | Dry, Solid | $3.05 \times 10^8/2.4$ |
| TNT | Dry, Solid | $4.87 \times 10^8/2.4$ |

| Material | Condition | Energy, $N/m^2$ |
|---|---|---|
| RDX | Dry, Solid | $3.59 \times 10^8/2.4$ |
| Black Powder | Granules | $>12.2 \times 10^8/2.4$ |
| M1 Propellant | Flake | $4.15 \times 10^8/2.4$ |
| M9 Propellant | Flake | $2.34 \times 10^8/2.4$ |
| M30 Propellant | Fines | $5.71 \times 10^8/2.4$ |

c. Electrostatic: Material exposed to energy stored in a charged capacitor. Results are expressed in joules as the minimum initiation level (Ref - Radford Rpt 100.10, dated Sep 76)

| Material | Condition | Energy, Joules |
|---|---|---|
| IMR-5010 | Granules | ≥5.0 |
| Lead Azide | Dry, Solid | 0.0028 |
| TNT | Dry, Solid | 0.5 |
| RDX | Dry, Solid | 0.5 |
| Black Powder | Granules | 0.53 |
| M1 Propellant | Flake | 1.26 |
| M9 Propellant | Flake | >5.0 |
| M30 Propellant | Fines | 0.26 |

7. Sensitivity (Comparison Values):

Impact (Apparatus)

| Explosive | PA inches | Bureau of Mines, cm | ERL, (PA Version) Type 12, 50%, cm |
|---|---|---|---|
| Lead Azide | 4-5 | 10-17 | - |
| PETN | 6 | 17 | <12 |
| TNT | 14 | 95-100+ | 80 |
| RDX | 8 | 32 | 23 |
| Black Powder | 16 | 32 | 229 |
| M1 Propellant | 6 (Grain) | - | - |
| | 4 (Powder) | - | |
| M9 Propellant | 2-3 | - | - |
| M30 Propellant | 4 | - | 16.2 |

8. National Stock Numbers (NSN)

| Part Number | NSN |
|---|---|
| 10534796-4 | 1376-01-048-9948 |
| 10534796-7 | 1376-01-049-1454 |
| 10534796-3 | 1376-01-066-5003 |